BY ORDER OF THE
SECRETARY OF THE AIR FORCE

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26 SEPTEMBER 2006

DOD ELECTROMAGNETIC ENVIRONMENTAL EFFECTS (E3) PROGRAM

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This supplement implements the policy of Department of Defense (DOD) Directive 3222.3, *DOD Electromagnetic Environmental Effects (E3) Program*, September 8, 2004. The DOD Directive is printed word-for-word in regular type, without editorial review. Air Force supplementary material is printed in boldface type and indicated by "(Added)(AF)." This supplement describes Air Force responsibilities under the directive, and establishes the Air Force E3 Program. The objective of this Air Force E3 Program is to achieve the electromagnetic compatibility (EMC) of all ground, air, and space electronic and electrical equipment, subsystems and systems. This supplement identifies the Air Force Frequency Management Agency (AFFMA) as the executive agent for the Air Force E3 Program. This supplement applies to Air Force activities including US Air Force Reserve and Air National Guard units and members that plan, design, develop, lease, procure, select sites for, install, operate, modify or maintain ground, air and space electronic, electrical, or communications equipment. It pertains to any subsystem, system, or other ground and aerospace equipment that are susceptible to, or capable of creating electromagnetic environmental effects through direct or indirect insertion into the electromagnetic environment.

Department of Defense
DIRECTIVE

NUMBER 3222.3

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ASD(NII)

SUBJECT: DOD Electromagnetic Environmental Effects (E3) Program

References: (a) DOD Directive 3222.3, "Department of Defense Electromagnetic Compatibility Program," August 20, 1990 (hereby canceled)

(b) JCS Joint Publication 1-02, "Department of Defense Dictionary of Military and Associated Terms," September 28, 2002

(c) DOD Instruction 4630.8, "Procedures for Interoperability and Supportability of Information Technology (IT) and National Security Systems (NSS)," June 30, 2004

(d) DOD 4120.24-M, "Defense Standardization Program Policies and Procedures," March 9, 2000

(e) (Added)(AF) Air Force Instruction 10-707, *Spectrum Interference Resolution Program*, 20 June 2005

(f) (Added)(AF) Air Force Instruction 33-118, *Electromagnetic Spectrum Management*, 18 July 2005

(g) (Added) (AF) National Telecommunication and Information Administration (NTIA) Manual, Chapter 5

1. REISSUANCE AND PURPOSE

This Directive:

1.1. Reissues reference (a) to update policy and responsibilities for the management and implementation of the DOD Electromagnetic Environmental Effects (E3) Program to ensure mutual electromagnetic compatibility (EMC) and effective E3 control among ground, air, sea, and space-based electronic and electrical systems, subsystems, and equipment, and with the existing natural and man-made electromagnetic environment (EME).

1.2. Assigns responsibilities for the execution of the DOD E3 Program.

1.3. Promotes the following DOD E3 Program objectives:

1.3.1. Achieving operational EMC for all electronic and electrical systems, subsystems, and equipment developed, acquired, and operated by the DOD Components. Operational EMC and effective E3 control is achieved when systems, subsystems, and equipment operate in their intended EME without suffering unacceptable performance degradation from E3 or causing unintentional performance degradation to other systems.

1.3.2. Attaining built-in design compatibility vice after-the-fact remedial measures.

1.3.3. Fostering of common DOD-wide philosophies, approaches, and tactics, techniques, and procedures in the development, design, production, test, and operation of military systems to preclude unacceptable degradation from E3.

1.4. (Added)(AF) Purpose. This supplement implements the policy of DOD Directive 3222.3 and establishes policy for the Air Force E3 Program.

2. APPLICABILITY

This Directive applies to the Office of the Secretary of Defense, the Military Departments, the Chairman of the Joint Chiefs of Staff, the Combatant Commands, the Office of the Inspector General of the Department of Defense, the Defense Agencies, the DOD Field Activities, and all other organizational entities in the Department of Defense (hereafter referred to collectively as the "DOD Components").

2.1. (Added) (AF) This supplement applies to all levels of command that plan, design, research, develop, test, acquire, lease, procure, select sites for, install, modify, maintain, logistically support, operate Air Force ground, air and space electrical and electronic equipment, subsystems and systems.

3. DEFINITIONS

3.1. Electromagnetic Environment (EME). The resulting product of the power and time distribution, in various frequency ranges, of the radiated or conducted electromagnetic emission levels that may be encountered by a military force, system, or platform when performing its assigned mission in its intended operational environment.

3.2. Electromagnetic Environmental Effects (E3). The impact of the EME on the operational capability of military forces, equipment, systems, and platforms. It encompasses all electromagnetic disciplines, including EMC and electromagnetic interference; electromagnetic vulnerability; electromagnetic pulse; electro-static discharge; hazards of electromagnetic radiation to personnel, ordnance, and volatile materials; and natural phenomena effects of lightning and precipitation static.

3.2.1. (Added)(AF) Hazards of Electromagnetic Radiation to Ordnance (HERO). HERO is RF energy coupled from the external Electromagnetic Environment of sufficient magnitude to cause premature actuation of ordnance.

3.2.2. (Added)(AF) Hazards of Electromagnetic Radiation to Personnel (HERP). HERP is personnel exposure to an electromagnetic field of sufficient energy to heat human tissue.

3.2.3. (Added)(AF) Hazards of Electromagnetic Radiation to Fuel (HERF). HERF is an electromagnetic field with sufficient energy to create sparks which can ignite combustibles, such as fuels.

3.3. Other terms used in this Directive are defined in JCS Pub 1-02 (reference (b)).

4. POLICY

It is DOD policy that:

4.1. All electrical and electronic systems, subsystems, and equipment, including ordnance containing electrically initiated devices, shall be mutually compatible in their intended EME without causing or suffering unacceptable mission degradation due to E3.

4.1.1. Identification of requirements for E3 control shall be initiated early during the concept refinement and technology development phases, fully defined prior to Milestone C, and verified throughout the acquisition process. Pertinent documents such as Capability Development Documents (CDDs), Capability Production Documents (CPDs), equipment specifications, Information Support Plans (ISPs), and Test and Evaluation Master Plans (TEMPs) shall specify, define, and verify E3 control requirements, as appropriate (DOD Instruction 4630.8, reference (c)). Combatant Commander Command and Control Initiative Program Documents should address E3 control requirements, as appropriate.

4.1.1.1. (Added)(AF) E3 control requirements must be considered during all phases of equipment planning, research, development, acquisition, logistic support, deployment, operation and disassembly. Each organization and person who participates in the generating of operational requirements, system design, development, testing, acquisition, off-the-shelf purchase, site surveys, logistic support and operation of Air Force electrical, electronic, or communications equipment must consider the requirement to achieve control of E3 in the intended operating environment.

4.1.1.2. (Added)(AF) Program Management Directives (PMD) will include E3 control requirements. Funding of applicable E3 control requirements will be included in the POM as part of the system life-cycle cost.

4.1.2. Operational effectiveness and suitability of all DOD weapons, command, control, communications, intelligence, surveillance, reconnaissance, and information systems in the intended operational EME shall be demonstrated. E3 issues shall be identified and assessed prior to entering the Systems Demonstration and Production and Deployment phases and shall be addressed during critical design reviews. TEMPs shall include within the scope of critical operational issues and sub-issues, the requirement to demonstrate the effective E3 control of systems, subsystems, and equipment. The

operational EMC disposition of systems, subsystems, and equipment shall be reported in the ISP or in other management/support plans analogous to the ISP.

4.1.3. Hazards of Electromagnetic Radiation to Ordnance (HERO), Hazards of Electromagnetic Radiation to Personnel, and Hazards of Electromagnetic Radiation to Fuel shall be mitigated prior to the conduct of all military exercises, operations, and activities.

4.2. Military E3 specifications, standards, and handbooks stressing interface and verification requirements, establishing operational performance, and specifying developmental and operational test methodologies shall be developed following guidance outlined in DOD 4120.24-M (reference (d)).

4.3. Analytical tools and databases for EMC analysis and E3 assessment shall be developed and maintained to predict, prevent, and correct E3 deficiencies of military systems in the intended operational EME.

4.4. The Department of Defense shall maintain measurement capability to quantify E3 of military systems to and from their intended operational EME.

4.4.1 (Added)(AF) E3 health hazard expert assistance can be obtained from the 311th Human Systems Wing, Brooks AFB TX. The 85 Engineering and Installation Squadron (EIS), Keesler AFB MS, is the Air Force provider of EMC, Electromagnetic Interference (EMI), Electromagnetic Radiation (EMR), and Electromagnetic Pulse (EMP) field measurement and analytical study capabilities. This capability can be requested over NIPRNET 85EIS.EEEM.Chief@keesler.af.milor SIPRNET 85eis.eee3@keesler.af.smil.mil.

4.5. E3 awareness and training shall be promulgated throughout the Department of Defense.

4.6. (Added)(AF) AFI 10-707, *Spectrum Interference Resolution Program*, establishes Air Force policy and procedures for detecting, reporting, and correcting Electromagnetic incompatibilities and Electromagnetic Interference.

4.7. (Added)(AF) Air Force agencies developing, procuring, or modifying equipment using the radio frequencies must ensure the device or system has obtained spectrum supportability and certification in accordance with AFI 33-118, *Electromagnetic Spectrum Management.*

5. RESPONSIBILITIES

5.1. The Assistant Secretary of Defense for Networks and Information Integration (ASD(NII)), as the Principal Staff Assistant for E3 matters, shall:

5.1.1. Be responsible for the DOD E3 Program and provide policy guidance for the implementation of E3 control requirements by the DOD Components.

5.1.2. Serve as the focal point for coordination and resolution of E3 issues involving non-DOD entities.

5.1.3. Establish a DOD E3 Integrated Product Team (IPT), composed of membership from the Military Services and appropriate Defense Agencies, to promote communication, coordination, commonality, and synergy among the DOD Components for E3-related matters.

5.1.4. Provide, in coordination with the Director, National Security Agency, guidance for development of DOD policies with respect to the control of E3 near Sensitive Communications sites and platforms concerning Intelligence, Surveillance, and Reconnaissance.

5.2. The Under Secretary of Defense, Acquisition, Technology, and Logistics (USD(AT&L)) shall:

5.2.1. Require Acquisition Programs to comply with E3 control requirements for DOD electrical and electronic equipment and systems.

5.2.2. Require that E3 control be addressed by milestone decision authorities (MDAs).

5.2.3. Ensure the Assistant to the Secretary of Defense, Nuclear and Chemical and Biological Defense Programs (ATSD(NCB)) shall provide nuclear electromagnetic pulse policy, guidance, and oversight. As the principal staff assistant and advisor to the Secretary of Defense and the USD(AT&L) for all matters concerning the formulation of policy and plans for nuclear weapons, the ATSD(NCB) shall coordinate with the ASD(NII) and the Joint Spectrum Center (JSC) to integrate these issues and survivability criteria into the DOD E3 Program.

5.3. The Under Secretary of Defense for Intelligence, shall require the Director, National Security Agency to:

5.3.1. Be the focal point for E3 control with respect to Intelligence, Surveillance, and Reconnaissance (ISR) sites and platforms.

5.3.2. Establish guidelines for the protection of electronic and electrical systems, subsystems, and equipment at ISR sites and platforms.

5.3.3. Mitigate electromagnetic interference at ISR sites and platforms.

5.3.4. Assign representation to the DOD E3 IPT.

5.4. The Director, Operational Test and Evaluation shall:

5.4.1. Require that E3 controls are adequately addressed in test and evaluation oversight programs and verified for compliance during operational test and evaluation. Require that E3 testing be addressed in TEMPs and that resources are identified to support E3 testing.

5.4.2. Require that program documentation contain sufficient information to support the identification and resolution of E3 issues.

5.4.3. Require that operational test authorities assess compliance with E3 control requirements.

5.4.4. Require that E3 assessments regarding the intended operational EME be performed early in the acquisition process.

5.5. The Heads of the DOD Components shall:

5.5.1. Require that MDAs under their authority enforce compliance with E3 control requirements during the acquisition of DOD electrical and electronic equipment and systems, including ordnance.

5.5.2. Require that their organizations adhere to E3 control requirements during the fielding of systems, subsystems, and equipment.

5.5.3. Require that E3 education and training for acquisition and operations personnel is included in formal schools and training centers for which they have responsibility.

5.6. The Chairman of the Joint Chiefs of Staff shall:

5.6.1. Provide, on behalf of the Commanders of the Combatant Commands, operational direction for resolution of joint E3 issues to the JSC through the Director, Defense Information Systems Agency.

5.6.2. Require that E3 control requirements are addressed by the Joint Requirements Oversight Council or the Component Acquisition Executives, as appropriate, for joint and multi-Service programs. In this regard, require that ICD, CDD, CPD, and ISP documents address E3 control requirements prior to validation.

5.6.3. Require that E3 control is addressed as part of the interoperability certification process.

5.6.4. Establish joint doctrine for mitigating HERO during joint operations and exercises.

5.7. The Secretaries of the Military Departments shall:

5.7.1. Require that E3 control requirements be addressed by Service Operational Test Authorities.

5.7.2. Provide a representative to participate on the DOD E3 IPT.

5.7.2.1. (Added)(AF) The Air Force Frequency Management Agency (AFFMA) ensures Air Force representation on the DoD E3 IPT.

5.7.3. (Added)(AF) Department of the Air Force Executive Agent for the DOD E3 Program is the Air Force Frequency Management Agency.

5.7.3.1. (Added)(AF) Each Air Force major command and field operating agency will manage electromagnetic compatibility analysis and spectrum management data via the allocation and the assignment process on all systems developed, acquired or operated within the organization according to AFI 33-118.

5.7.3.2. (Added)(AF) Air Force Materiel Command will:

5.7.3.2.1. (Added)(AF) Acquire and employ the expertise, measurement techniques, instrumentation and field engineering test facilities with the sensitivity, accuracy, range and stability necessary to provide valid EME data on Air Force systems.

5.7.3.3. (Added)(AF) Air Combat Command will:

5.7.3.3.1. (Added)(AF) Maintain the Quick Fix Interference Reduction Capability (QFIRC) which will provide an EMI investigation and resolution capability for the Air Force and provide level of effort funding to the 85 EIS to sustain and execute this mission. The Air Force QFIRC Program is operated by the 85 EIS, Keesler AFB MS.

5.7.3.4. (Added)(AF) As the Air Force Service Cryptologic Element (SCE) assigned by Director, National Security Agency (DIRNSA), Headquarters Air Intelligence Agency shall implement the policies, guidelines and mitigation efforts for E3 control at Air Force ISR sites and platforms.

6. EFFECTIVE DATE

This Directive is effective immediately.

Paul Wolfowitz
Deputy Secretary of Defense

MICHAEL W. WYNNE
Secretary of the Air Force